
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: January 2007

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of January 2007, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of January was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. During January, the standard for compliance stations C-2, S-64, S-49, S-42, and S-21 were 12.5 mS/cm. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for January 2007 started off below 14,000 cfs, then decreased down to about 10,000 cfs before the first rainfall event occurred on January 4. The amount of rainfall was small and resulted outflow to increase to about 12,000 for a few days before significantly decrease to about 5,000 cfs by mid-January. Thereafter, another small precipitation event brought outflow up to about 8,000 cfs and remained at that level until January 23, when it decreased again for the third time but holding steady above 6,000 cfs before the last rainfall event of the month brought another increase in outflow to end the month at about 8,300 cfs. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for January 2007 is listed below:

Month	Mean NDOI (cubic feet per second)
January	8,721

2.3 Rainfall

There were very minimal rainfall activities in January. The monthly total was three times less than previous month. Rainfall occurrences were observed only three times during the month where all three rainfall daily totals were below 0.075 inches. The largest daily rainfall total of the month was 0.07 inches. The monthly total is shown below.

Month	Total Rainfall (inches)
January	0.20

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during January 2007 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
January 1 – 24	Open	Out	Closed
January 25- 31	Tidally operated	IN	Open daylight hrs

SMSCG operations commenced on January 25, 2007, due to salinity concerns in the marsh. Salinity levels were more of a concern coming into February, where the standard for the month is stricter than January. As such, DWR implemented the gates to operate in late January to allow fresher water into Montezuma with the hope that salinity will be reduced coming into February at manageable salinity levels. Typically, past operations would have commenced in the Fall, but due to the revised SMPA (June 2005), DWR mode of operation has been changed to accommodate fish passage. As such, salinity levels for each month is higher than past years because we allowed salinity to increase to further delay gate operations for fish passage, but not at a level where salinity standards are compromised or exceeded.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;

- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During January 2006 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) were all below 12.5 mS/cm as shown in Figure 1. There were no significant salinity levels changes. There were reduction in salinity levels at most of the stations with the onset of the gates in late January with varying effects due to the proximity of the gates relative to each station. Stations that are closer to the gates (i.e. S64) will get the largest reduction in salinity and at an earlier time than other stations. Further west, stations such as S35 and S97 have very minimal to no gain of gate operations, whereas Collinsville station salinity increased slightly due to gate operation. This salinity increase effect is due to fresher water being diverted into Montezuma slough with gate operation and allowing saltier water to fill that diverted spot.

Overall, salinity levels in January 2007 were below standards at all compliance and monitoring stations.

S-21 (Sunrise Club) continues to be out of service since late December 2005 due to flooded event, thus S-21 station will not be reported in future reports until further notice. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season while repair work is being done at S21 site.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for January 2007 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations is most comparable to the 2000 year. January 2007 salinity levels overall seems slightly higher compared to the 2000 year, except at Collinsville and Morrow stations. Compared to previous nine years, January 2007 salinity levels were overall ranked first in high Specific Conductance, thus making it the last lowest salinity levels month.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****January 2007**

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	2.9	12.5	Yes
S-64	7.9	12.5	Yes
S-49	10.1	12.5	Yes
S-42****	10.5	12.5	Yes
S-21***	n/a	n/a	n/a

*milliSiemens per centimeter

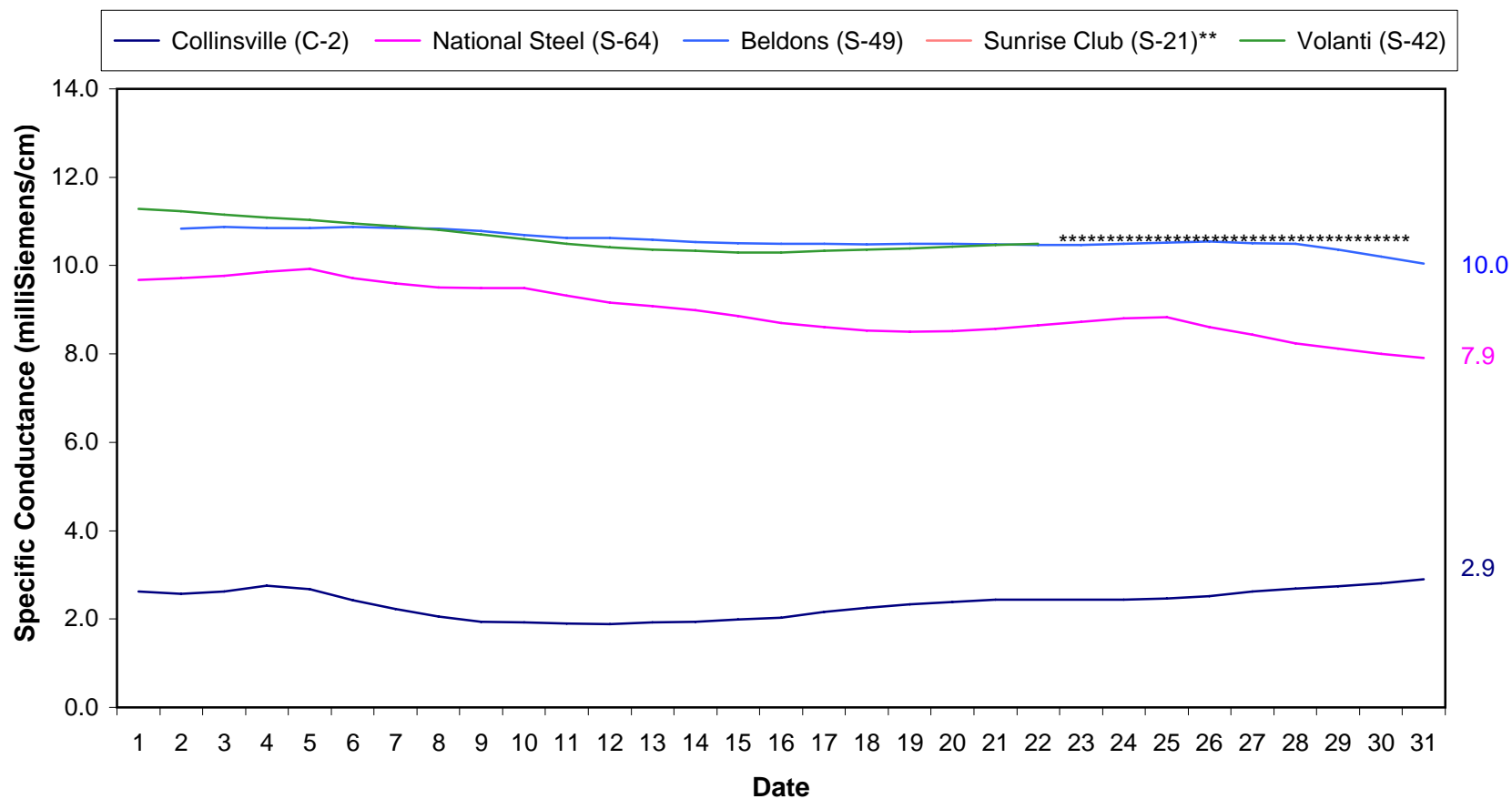
**The representative data from nearby USBR station is used in lieu of data from station C-2.

***station is temporarily out of service. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season.

****S42 value is not representative since it contains missing data, but the number of missing data is not enough to alter the end of month pdm value.

**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2007**

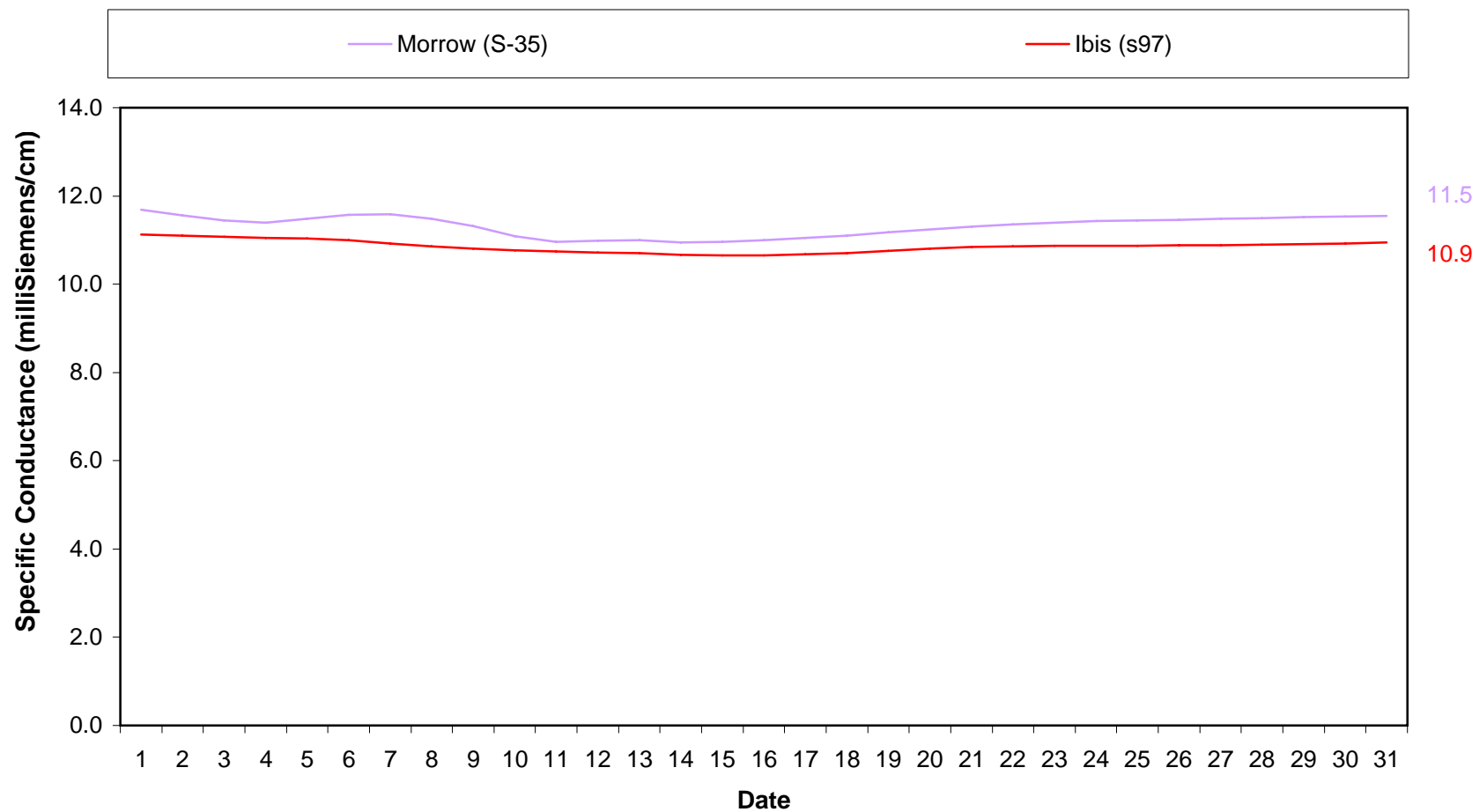
Standard = 12.5 mS/cm



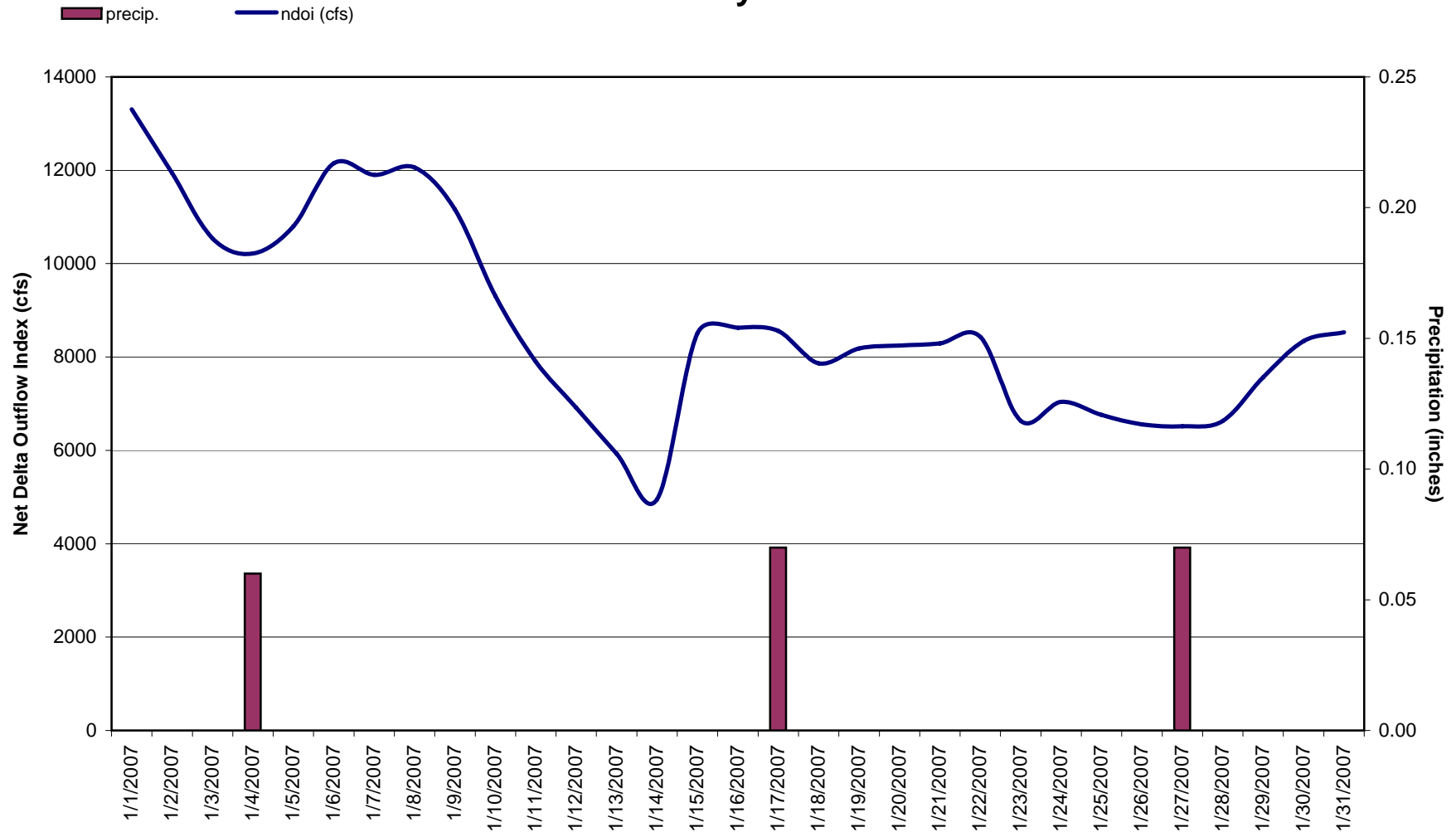
*S42 missing data from 1/23/07 due to equipment failure.

**S21 remains out of service for flood repair work.

**Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2007**

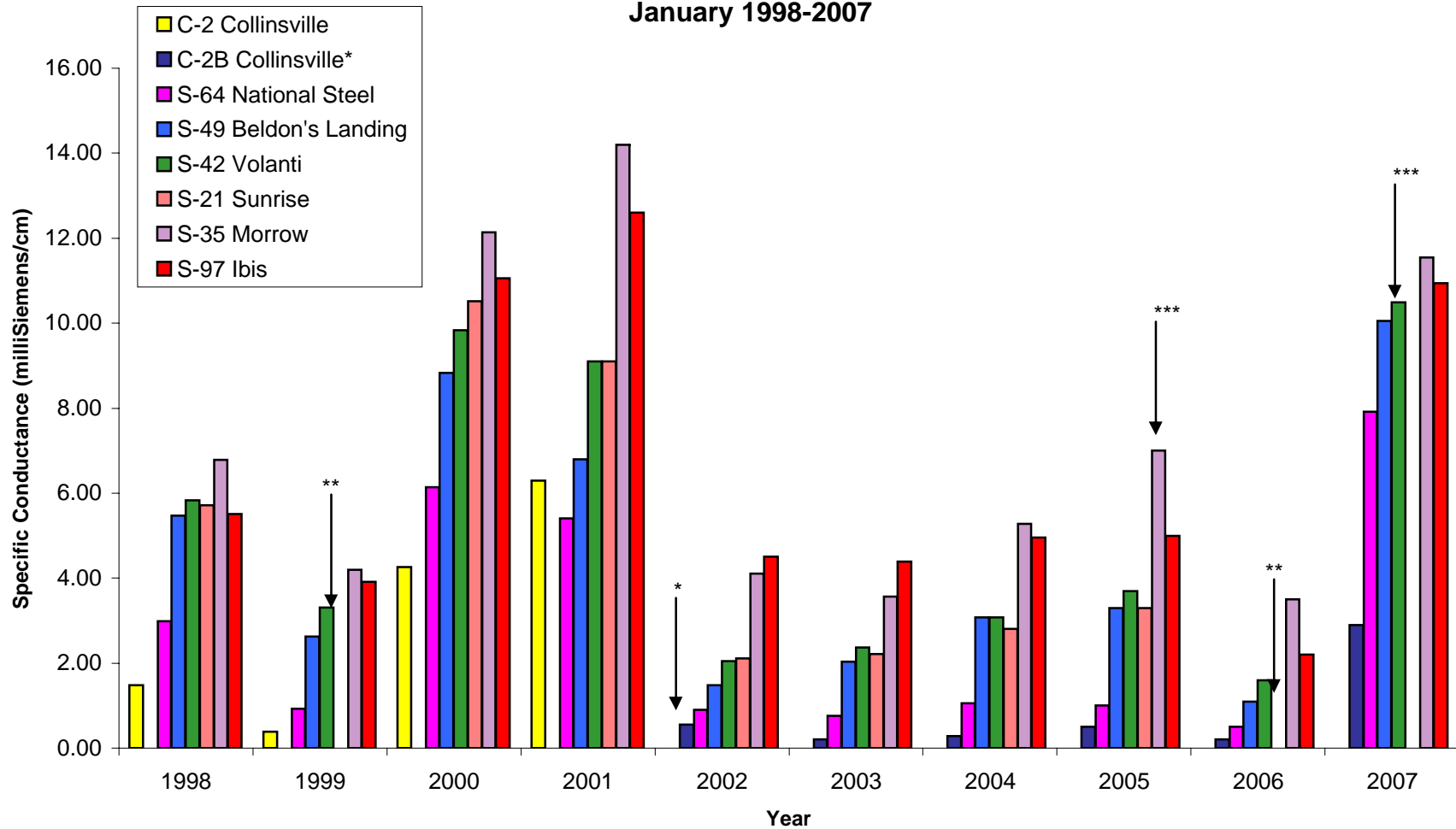


**Figure 3. Daily Net Delta Outflow Index and Precipitation*
January 2007**



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

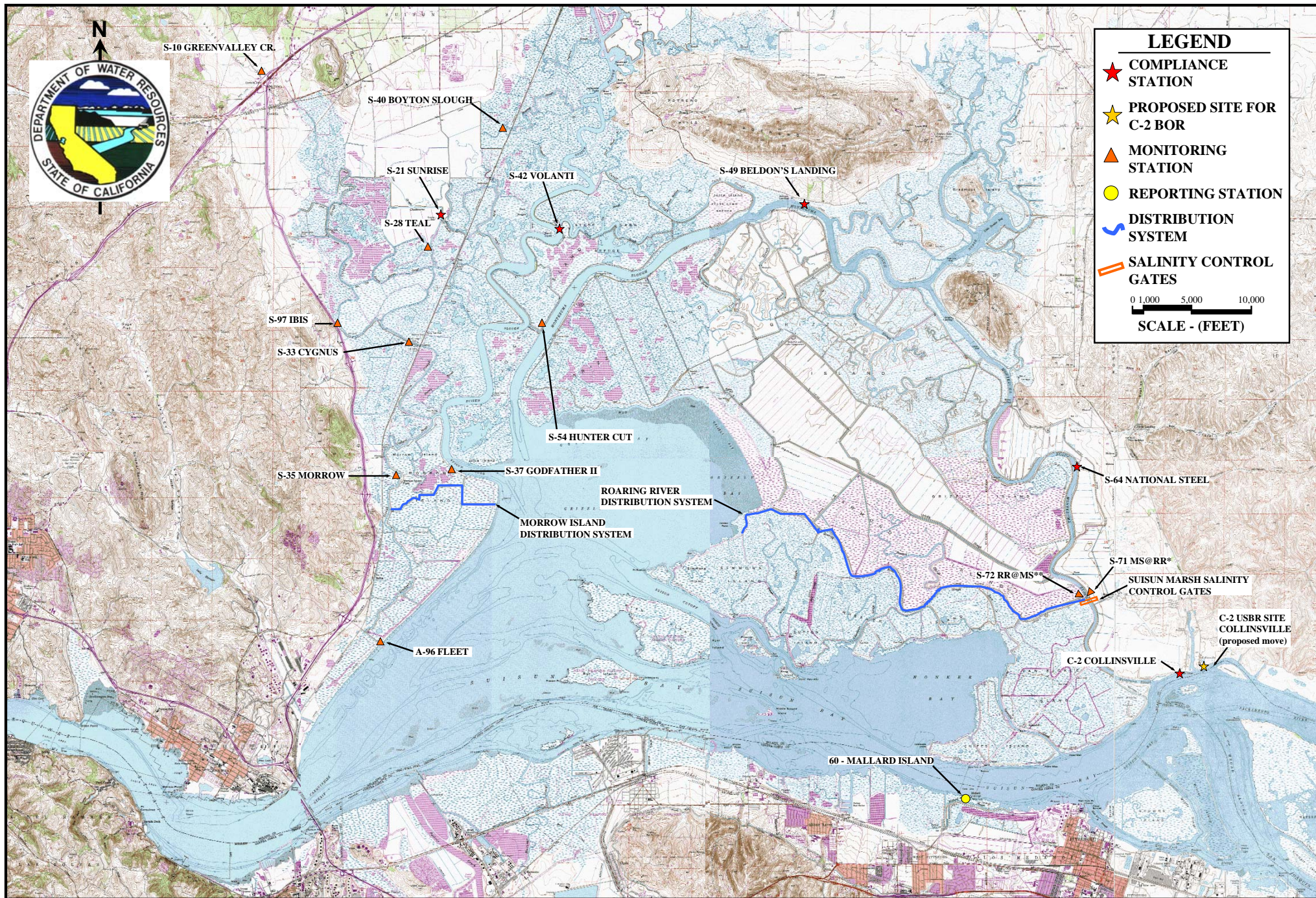
**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
January 1998-2007**



* = beginning in 2002.

** Data was not obtained due to equipment problem or flood constraint.

***Data not representative of end of month value due to missing data.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES